

What is claimed is:

1. A wireless LAN apparatus comprising:  
as a transmitting-side configuration thereof,  
5 a packet length controlling unit,  
the packet length controlling unit controlling a packet  
length of transmit data;  
a packet synthesizing unit,  
the packet synthesizing unit synthesizing the number of  
10 the transmit data corresponding to the packet length controlled  
by the packet length controlling unit into a packet transmit  
data and outputting the transmit packet data;  
a frame synthesizing unit,  
the frame synthesizing unit appending the packet-length  
15 information to a header information of the transmit packet data  
synthesized by the packet synthesizing unit and outputting the  
transmit packet data as a transmit frame; and  
a wireless transmit unit,  
the wireless transmit unit transmitting wirelessly the  
20 transmit frame output by the frame synthesizing unit.
2. A wireless LAN apparatus as claimed in Claim 1, wherein  
the packet length controlling unit comprises a packet  
length register, the packet length register capable of externally  
controlling the packet-length information.
- 25 3. A wireless LAN apparatus as claimed in Claim 2, wherein  
the packet length controlling unit comprises:  
a timer, the timer restarting based on an input of a reset  
signal;  
a timer termination register,  
30 the timer termination register instructing a count  
termination value of the timer; and  
a force-transmit instructing device,  
the force-transmit instructing device outputting a

transmit instructing signal to the packet synthesizing unit when a count value counted by the timer agrees with the count termination value instructed by the timer termination register, and wherein

5           the packet synthesizing unit outputs the reset signal to the timer based on the output of the transmit packet data and prioritizes the transmit packet data over the packet-length information from the packet length register when the transmit instructing signal from the force-transmit instructing unit is  
10 input thereto to thereby output immediately the transmit packet data.

4.       A wireless LAN apparatus as claimed in Claim 2 further comprises,

          as the transmitting-side configuration thereof,  
15           a data rate detecting unit,  
          the data rate detecting unit detecting a transmit rate of the transmit data input to the packet synthesizing unit and outputting the detection result as a data rate detection signal, wherein

20           the packet length controlling unit further comprises a packet-length rate controlling device,  
          the packet-length rate controlling device increasing or decreasing the packet-length information from the packet length register based on the data rate detection signal from the data  
25 rate detecting unit.

5.       A wireless LAN apparatus as claimed in Claim 1 further comprises:

          as a receiving-side configuration thereof,  
          a wireless receive unit,  
30           the wireless receive unit receiving the transmit frame transmitted wirelessly by another wireless LAN apparatus configured likewise; and  
          an error detecting unit,

the error detecting unit judging whether or not the received transmit frame is normally received, wherein

as the receiving-side configuration of the apparatus, the wireless transmit unit wirelessly transmits a receive data indicating the judgment result with respect to the wireless receive unit to the another wireless LAN apparatus, and

the wireless LAN apparatus further comprises, as the transmitting-side configuration thereof, a retransmit controlling unit,

the retransmit controlling unit requesting the wireless transmit unit to retransmit the same transmit frame when it is judged that an transmission error occurred from the receive data, wherein

as the transmitting-side configuration of the apparatus,

the packet length controlling unit further comprises:

a retransmit counting device,

the retransmit counting device counting the number of the requests for retransmission from the retransmit controlling unit;

a retransmit-count upper limit register,

the retransmit-count upper limit register setting a count upper-limit value of the retransmit counting device; and

a retransmit-packet length controlling device maintaining a value of the packet-length information when the number of the retransmission requests counted by the retransmit counting device is smaller than the count upper-limit value set by the retransmit-count upper limit register and

decreasing the value of the packet-length information and when the number of the retransmission requests counted by the retransmit counting device agrees with the count upper-limit value set by the retransmit-count upper limit register.

6. A wireless LAN apparatus as claimed in Claim 1 further comprises:

as a receiving-side configuration thereof,  
a wireless receive unit,  
the wireless receive unit receiving the transmit frame  
transmitted wirelessly by another wireless LAN apparatus  
5 configured likewise; and  
an error detecting unit,  
the error detecting unit judging whether or not the  
received transmit frame is normally received, wherein  
as the receiving-side configuration of the apparatus, the  
10 wireless transmit unit wirelessly transmits a receive data  
indicating the judgment result with respect to the wireless  
receive unit to the another transmitting-side wireless LAN  
apparatus, and  
the wireless LAN apparatus further comprises,  
15 as the transmitting-side configuration thereof,  
a retransmit controlling unit,  
the retransmit controlling unit requesting the wireless  
transmit unit to retransmit the same transmit frame as a  
most-recently-transmitted transmit frame when it is judged that  
20 an transmission error occurred based on the receive data and  
judging whether or not the retransmission is successful, wherein  
as the transmitting-side configuration of the apparatus,  
the packet length controlling unit further comprises:  
a retransmit counting device,  
25 the retransmit counting device counting the number of the  
retransmission requests from the retransmit controlling unit;  
a retransmit count averaging device,  
the retransmit count averaging device calculating an  
average value of the number of the retransmission requests when  
30 it is judged that the retransmission is successful;  
a retransmit-count upper limit register,  
the retransmit-count upper limit register setting a count  
upper-limit value of the retransmit counting device; and

a retransmit-packet length controlling device maintaining a value of a packet-length according to the most-recently-transmitted transmit frame as the packet length of the transmit data to be retransmitted when the average value  
5 calculated by the retransmit count averaging device is smaller than the count upper-limit value set by the retransmit-count upper limit register and

setting a decreased value of the packet length of the most-recently-transmitted transmit frame as the packet length  
10 of the transmit data to be retransmitted when the average value calculated by the retransmit count averaging device agrees with the count upper-limit value set by the retransmit-count upper limit register.

7. A wireless LAN apparatus as claimed in Claim 1, wherein  
15 as a receiving-side configuration of the apparatus,

the wireless transmit unit creates a packet length control frame enabling the packet length of the transmit frame transmitted by another wireless LAN apparatus to be designated by the receiving-side wireless LAN apparatus of the present  
20 invention and wirelessly transmits the packet length control frame to the another wireless LAN apparatus, further comprises:

as the transmitting-side configuration thereof,  
a wireless receive unit,

the wireless receive unit receiving the packet length  
25 control frame transmitted wirelessly by another wireless LAN apparatus configured likewise; and

a packet length control frame detecting unit,

the packet length control frame detecting unit judging the packet length control frame received by the wireless receive  
30 unit and

outputting a packet length request-to-reduce signal when the packet length control frame instructs the packet length to be reduced and a packet length request-to-extend signal when

the packet length control frame instructs the packet length to be extended, wherein

as the transmitting-side configuration of the apparatus,  
the packet length controlling unit reduces the  
5 packet-length information when the packet length  
request-to-reduce signal is input thereto and extends the  
packet-length information when the packet length  
request-to-extend signal is input thereto.

8. A wireless LAN apparatus comprising:

10 as a transmitting-side configuration thereof,  
a wireless transmit unit,  
the wireless transmit unit synthesizing one or a plurality  
of transmit data into a transmit packet data and  
appending a packet-length information indicating the  
15 number the transmit data synthesized into the transmit packet  
data to a header information of the transmit packet data and  
transmitting wirelessly the transmit packet data as a transmit  
frame;

as a receiving-side configuration thereof,  
20 a wireless receive unit,  
the wireless receive unit receiving the transmit frame  
transmitted wirelessly by another wireless LAN apparatus  
configured likewise;

a packet extracting unit,  
25 the packet extracting unit separating the received  
transmit frame into the transmit packet data and the header  
information;

a packet length detecting unit,  
the packet length detecting unit detecting the  
30 packet-length information included in the transmit frame in the  
header information separated from the transmit frame by the  
packet extracting unit; and

a packet dividing unit,

the packet dividing unit dividing the transmit packet data separated from the transmit frame by the packet extracting unit based on the packet-length information detected by the packet length detecting unit and outputting the divided transmit packet data.

9. A wireless LAN apparatus as claimed in Claim 8 comprises:  
as the receiving-side configuration thereof,  
a buffer capacity detecting unit,

the buffer capacity detecting unit detecting a buffer remaining capacity indicating a free space of the buffer for receiving packets;

a buffer capacity comparing unit,

the buffer capacity comparing unit comparing the buffer remaining capacity detected by the buffer capacity detecting unit to a first buffer-capacity comparison value indicating that the remaining capacity of the buffer is too small and

comparing the buffer remaining capacity detected by the buffer capacity detecting unit to a second buffer-capacity comparison value indicating that there is a sufficient buffer remaining capacity;

a buffer control frame creating unit,

the buffer control frame creating unit outputting a buffer limit frame when the buffer remaining capacity larger than the first buffer-capacity comparison value decreases to be equal thereto according to the buffer capacity comparing unit and

outputting a buffer limit releasing frame when the buffer remaining capacity smaller than the second buffer-capacity comparison value increases to be equal thereto; and

a wireless transmit unit,

the wireless transmit unit transmitting wirelessly the buffer limit frame or the buffer limit releasing frame output by the buffer control frame creating unit; wherein

as the transmitting-side configuration of the apparatus,

the packet length controlling unit controls a packet length of transmit data based on the buffer limit frame or the buffer limit releasing frame transmitted from another wireless LAN apparatus configured likewise.

- 5 10. A wireless LAN apparatus as claimed in Claim 1 comprises:  
as a receiving-side configuration thereof,  
a wireless receive unit,

the wireless receive unit receiving the transmit frame transmitted wirelessly by another wireless LAN apparatus  
10 configured likewise and detecting a  
transmit-channel-distortion information in the received  
transmit frame;

a packet extracting unit,

the packet extracting unit separating the received  
15 transmit frame into the transmit packet data and the header  
information;

a packet length detecting unit,

the packet length detecting unit detecting the  
packet-length information included in the transmit frame in the  
20 header information separated from the transmit frame by the  
packet extracting unit; and

a packet dividing unit,

the packet dividing unit dividing the transmit packet data  
separated from the transmit frame by the packet extracting unit  
25 based on the packet-length information detected by the packet  
length detecting unit and outputting the divided transmit packet  
data, wherein

as the transmitting-side configuration of the apparatus,

the packet length controlling unit controls the packet  
30 length of the transmit data based on the  
transmit-channel-distortion information detected by the  
wireless receive unit.

11. A wireless LAN apparatus as claimed in Claim 10 further



comprises:

as the transmitting-side configuration thereof,

a RSSI judging unit,

the RSSI judging unit judging an electric power of the  
5 received transmit frame based on the  
transmit-channel-distortion information detected in the  
transmit frame by the wireless receive unit serving to receive  
the transmit frame transmitted wirelessly by another wireless  
LAN apparatus configured likewise; and

10 a packet-length information creating unit,

the packet-length information creating unit creating a  
packet length setting signal for the transmit frame transmitted  
wirelessly by the wireless LAN apparatus according to the present  
invention based on the judgment result by the RSSI judging unit  
15 and

outputting the packet length setting signal to the packet  
length controlling unit, wherein

as the transmitting-side configuration of the apparatus,

the packet length controlling unit control the packet  
20 length of the transmit data based on the packet length setting  
signal.

12. A wireless LAN apparatus as claimed in Claim 10, wherein  
as the receiving-side configuration thereof,

the wireless receive unit outputs a peak-value information  
25 indicating the status of a peak value of a correlation signal  
in connection with a synchronous reference symbol of the transmit  
frame received from another wireless LAN apparatus configured  
likewise, further comprises:

as the receiving-side configuration thereof,

30 a synchronous detection signal judging unit,

the synchronous detection signal judging unit judging the  
status of transmission channel for transmitting wirelessly the  
transmit frame based on the peak-value information; and

a packet-length information creating unit,

the packet-length information creating unit creating a packet-length setting information for the transmit data based on the judgment result by the synchronous detection signal judging unit and outputting the packet-length setting information to the packet length controlling unit, wherein

as the transmitting-side configuration of the apparatus,

the packet length controlling unit controls the packet length of the transmit data based on the packet-length setting information.

13. A wireless LAN apparatus as claimed in Claim 10, wherein as the receiving-side configuration thereof,

the wireless receive unit outputs an integral width of a correlation signal in connection with a synchronous reference symbol of the transmit frame received from another wireless LAN apparatus configured likewise, further comprises:

as the receiving-side configuration thereof,

a synchronous detection signal judging unit,

the synchronous detection signal judging unit judging the status of transmission channel for transmitting wirelessly the transmit frame based on the integral width; and

a packet-length information creating unit,

the packet-length information creating unit creating a packet-length setting information for the transmit data based on the judgment result by the synchronous detection signal judging unit and outputting the packet-length setting information to the packet length controlling unit, wherein

as the transmitting-side configuration of the apparatus,

the packet length controlling unit controls the packet length of the transmit data based on the packet-length setting information.

14. A wireless LAN apparatus as claimed in Claim 10, wherein as the receiving-side configuration thereof,

the wireless receive unit outputs a constellation distortion signal based on a difference between an actual mapping value and an ideal mapping value of the transmit frame received from another wireless LAN apparatus configured likewise, further  
5 comprises:

as the receiving-side configuration thereof,  
a synchronous detection signal judging unit,  
the synchronous detection signal judging unit detecting  
the status of transmission channel for transmitting wirelessly  
10 the transmit frame based on the constellation distortion signal;  
and

a packet-length information creating unit,  
the packet-length information creating unit creating a  
packet-length setting information for the transmit data based  
15 on the judgment result by the synchronous detection signal  
judging unit and outputting the packet-length setting  
information to the packet length controlling unit, wherein  
as the transmitting-side configuration of the apparatus,  
the packet length controlling unit controls the packet  
20 length of the transmit data based on the packet-length setting  
information.

15. A wireless LAN apparatus as claimed in Claim 10, wherein  
as the receiving-side configuration thereof,  
the wireless receive unit outputs a Viterbi error count  
25 signal based on a difference between a branch metric according  
to a maximum-likelihood path and a branch metric according to  
other than the maximum-likelihood path, further comprises:

as the receiving-side configuration thereof,  
a synchronous detection signal judging unit,  
30 the synchronous detection signal judging unit judging the  
status of transmission channel for transmitting wirelessly the  
transmit frame based on the Viterbi error count signal; and  
a packet-length information creating unit,

the packet-length information creating unit creating a packet-length setting information for the transmit data based on the judgment result by the synchronous detection signal judging unit and outputting the packet-length setting information to the packet length controlling unit, wherein  
5 as the transmitting-side configuration of the apparatus, the packet length controlling unit controls the packet length of the transmit data based on the packet-length setting information.

10 16. A wireless LAN apparatus as claimed in Claim 1 further comprises:

as a receiving-side configuration thereof,

a wireless receive unit,

the wireless receive unit receiving the transmit frame  
15 transmitted wirelessly by another wireless LAN apparatus configured likewise;

a packet extracting unit,

the packet extracting unit separating the received transmit frame into the transmit packet data and the header  
20 information;

a packet length detecting unit,

the packet length detecting unit detecting the packet-length information included in the transmit frame in the header information separated from the transmit frame by the  
25 packet extracting unit;

a packet dividing unit,

the packet dividing unit dividing the transmit packet data separated from the transmit frame by the packet extracting unit based on the packet-length information detected by the packet  
30 length detecting unit and outputting the divided transmit packet data; and

a receive-accuracy information creating unit,

the receive-accuracy information creating unit creating

a receive-accuracy information signal based on the packet length setting signal used for controlling the packet length in the packet length controlling unit, wherein

5           as the transmitting-side configuration of the apparatus,  
the wireless receive unit controls a bit width for receive processing and an accuracy for processing a retained volume of receive data based on processing and an accuracy for processing a receive-data retained volume based on the receive-accuracy information signal.

10